Survey on Village Based Chicken Production and Utilization System in Mid Rift Valley of Oromia, Ethiopia

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Survey on Village Based Chicken Production and Utilization System in Mid Rift Valley of Oromia, Ethiopia

Samson Leta and Endalew Bekana

Adami-Tullu Agricultural Research Center,
Poultry Technology Research Team, Ziway, Ethiopia

Abstract: The survey was carried out in mid-rift valley of Oromia to generate information on village based indigenous chicken production and utilization system. The results of the study showed that the dominant chicken production system of the study area was a free range system using majority of indigenous chicken (94%) managed mainly on scavenging with conditional feed supplementation. The mean chicken flock size per household of the study area was 13 chickens. The survey indicated that almost all farmers provided night shelter for their chickens. Broody hens were the sole means of egg incubation and chick brooding in the study area. Most chicken keepers in the study area had the tradition of selecting chicken for replacement stock. Body size, finger accommodation of the pelvic bones and pedigree performance were the major means of selection. Predators and chicken diseases were considered be the largest threat to village chicken production. The price of chicken products varied among months of the year and determined by a number of factors such as holyday vs fasting seasons as well as the ordinary days vs market days. The survey further identified that in village poultry production women and children were more involved than men.

Key words: Indigenous chicken % Scavenging % Predators % Chicken Diseases

INTRODUCTION

The total chicken population in the country is estimated to be 39.6 million [1]. The majorities (99%) of these chickens are maintained under a traditional system with little or no inputs for housing, feeding or health care [2]. In most part of Ethiopia, village chicken represents a significant component of the rural household livelihood as a source of cash income and nutrition [3]. Indigenous chickens, which are managed under extensive systems account for 99 % of the total chicken population in Ethiopia [4]. This indicates that traditional chicken keeping is practiced by virtually every family in rural Ethiopia because they provide protein for the rural population and generate family income. Furthermore, the indigenous chickens are good scavengers and foragers, well adapted to harsh environmental conditions and their minimal space requirements make chicken rearing a suitable activity and an alternative income source for the rural Ethiopian farmers [5]. In addition, the local chicken sector constitutes a significant contribution to human livelihood and contributes significantly to food security of poor households [3, 6].

In Ethiopia lack of knowledge about poultry production, limitation of feed resources, prevalence of economically important diseases (Newcastle, Coccidiosis, etc) as well as institutional and socio-economic constraints remains to be the major challenges in village based chicken productions [7]. Despite the important roles of chickens, rearing them can be considered as aside line agricultural activity. There are many complex and varying constraints to chicken production systems, which in turn influence their production and productivity potential. Knowledge and understanding of the chicken production and utilization systems, opportunities and constraints are important in the design and implementation of village based chicken development programmes, which can benefit rural societies.

Therefore; the objective the study was carried out to generate base line information on village based chicken production system, utilization, opportunities and challenges.

Corresponding Author: Samson Leta, Adami-Tullu Agricultural Research Center, P.O. Box 35, Ziway, Ethiopia,
Tel: +251 464 41 91 01, Fax +251 464 41 91 08,
Cell: Phone +251 911 05 60 20, Email: samiwude@gmail.com

MATERIALS AND METHODS

Study Area: The study was conducted in mid rift valley of Ethiopia; west Arsi and east Shoa zones in randomly selected districts namely the Siraro, Shalla, Shashamane, Adami-Tullu Jido kombolcha and Boset. The area is found within the mid rift valley (situated at 7°09"N to 8°45'N and 38°32'E to 39°17'). The mid rift valley of Ethiopia which mainly comprises the east Shoa and west Arsi zones of Oromia regional state. The valley has about 40-60km width and more than hundreds kilos meters length bounded by high land plateaus. The mid rift valley has an erratic, unreliable and low rain fall, averaging between 500 and 900mm per annum [8].

Study Design: Questionnaire survey of chicken production system was conducted in different districts of the mid rift valley of Oromia, Ethiopia.

Statistical Analyses: Descriptive statistics such as mean, range, frequency and percentage were used to analyze the data using Statistical Package for Social Sciences [9].

RESULTS AND DISCUSSION

Socio-Economic Benefits: The survey results indicated that chicken production is widely practiced in mid rift valley of Oromia. It is used as a source of income for immediate household expenses. According to the survey result majority of village chicken production 92.4% were owned by females and children (Table 1). This indicated that most of the time the women and children are responsible for chicken rearing, while the men are responsible for other off- farm activities. This is in agreement with the research results reported by Mcainsh *et al*. [10]. Majority of chicken keepers in study

Table 1: Socio-economic characteristics

	West Arsi		East Shoa			
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Variables	Adami-Tullu	Boset	Districts Shashamanne	Siraro	Shalla	Overall
Sample size (no.)	8	32	27	15	6	88
Sex of the respondent (%):						
Male	50	15	17	14	6	56
Female	50	17	10	1	0	32
Average age of the respondent	38	36	31	34	31	34
Average flock size/HH:						
Local	17.25	11.94	10.41	14.13	12.5	12
Exotic	4.13	0.81	0.04	0.13	0.5	0.76
Who owns chickens in HH (%):						
Wife	43.75	34	20.5	27	8.3	26.7
Husband	0	24.5	13.5	0	0	7.6
Children	56.25	41.5	66	73	91.7	65.7
Uses and function of chicken and chicken product (%):						
For home expenditure	35	45.5	48	39	34.5	44
For home consumption	20	25.5	23	29	40.5	24
For ceremony and/or sacrifice	20	21	20	22.5	15.5	22
For deposit	25	8	9	9.5	9.5	10
Season of selling chicken (%):						
Sep-Nov.	-	64	46	58.3	20	38
Dec-Feb.	-	15	15	16.6	0	9
March-may	-	11	15	8.3	80	23
June-Aug.	-	10	24	16.6	0	10
Season of buying chicken (%):						
Sep-Nov.	0	4	5.5	33.3	0	9
Dec-Feb.	0	4	11	0	25	8
March-may	0	27	11	8.3	0	9
June-Aug.	100	65	72.5	57.3	75	74
Color preference (%)						
Yes	100	87.5	81.5	100	100	94
No	0	12.5	18.5	0	0	6
Color preferred (%)						
Brown/gray/red	60	81	78	91	50.3	72
White	25	8	0	0	16.3	10
Black	15	11	22	9	33.3	18

area uses chickens and chicken by product for home expenditure (44%) followed by home consumption 24%, for ceremony and/or sacrifice 22 and 10% for deposit.

The overall average flock size in the study area was 13 chickens per house hold (12 chickens per household for local chickens and less than one exotic chicken per household) which is in line with the work done by Gueye [11], who reported that the flock sizes generally ranged from 5 to 20 fowls per African village household.

An average flock size of 16 birds was also reported in the central parts of Ethiopia [12]. According to this survey 96% of the village chicken producers keep all ages of chicken together.

Chicken and eggs are usually taken to the local market by women and children (78%) and sold to traders or directly to consumers. The decision maker for egg and chicken sell and home consumption are husband and wife. In the study area the price of eggs was related to the orthodox Christian fasting months and holidays. The price of live birds is often double during holidays and reducers during fasting season. The price of live chickens is affected by seasonal supply and demand especially during holidays and fasting months. September, January and May are the months of high demand for eggs and chickens this finding is in Agreement with the result reported by Aklilu *et al*. [6]. According to the respondents there are color preferences; brown, gay and black colors being the more preferred. Farmers in the survey area usually buy chickens during June, July and August this is because at these months there is no holidays as a result the price of chicken reduces significantly.

Management Practices in Village Poultry Production
Village Poultry Feeds and Feeding: The results of the study showed that the dominant chicken production system of the study area is a free range system using majority of indigenous chicken (94%) managed mainly on scavenging with conditional feed supplementation. However, majority of the farmers 98% practiced supplementary feeding systems which is usually offered mostly once per day (64%) and uses greater than 90% maize, wheat, sorghum and household waste products as the main supplement of chicken feed and 60% of village chicken keepers cultivate feed suitable for poultry like maize, wheat and sorghum; no village poultry producer formulate chicken feed. This result is similar to the results of work done by Halima [13] in northern Ethiopia who reported that 96.8% of the farmers supplied partial supplementation of feeds and 95.5 % of the feed was produced locally. Almost all farmers provide water for chickens, 47% providing throughout the day, 14% once per day, 18% twice a day, 16% three times a day, 5% four times a day and the source of water is 66% tap, 15% river water, 6% bore hall and others 13%. The survey also indicated that 60% and 15% of the supplementary feeding and watering activity was performed by females and children respectively. Furthermore 95% of the respondents indicated that major time of feed shortage is June to August.

Village Poultry Housing: The survey indicated that almost all farmers provided night shelter (Table 2) for their chickens in either part of the kitchen (1.4 %), in the main house (58%), perch 26.6% and/or in separate sheds purpose-made for chickens (14 %). According to the survey men take their share in poultry production by contracting poultry house accounting 57.5% followed by children accounting for 30%. In Botswana 35.8 % of the indigenous chicken farmers provided housing of some kind [14]. It was further indicated that chickens were confined only during the night and 81 % of the households clean the chickens' house once per day, while 14 % of the owners cleaned it twice per day (Table 2). This result is in agreement with the survey undertaken by Halima [13] in northern Ethiopia who reported 74.02 % of the households cleaned their chickens' house once per day, while 11.66 % of the owners cleaned it twice per day.
Incubation and Hatching in Village Poultry Production: From the survey it is understood that exclusively natural incubation and hatching is practiced and 54% of the respondents incubate chicken eggs at any time while 42% of the respondents incubate chicken eggs at dry season. According to the survey 61% of the respondents identify spoiled eggs during incubation by sun candling 39%, shaking 33% and putting in water 28%. The total number of eggs incubated using a broody hen varied from 7-15 out of 10-18 eggs laid/clutch/ hen. Relatively fair number (5-10) chicks were hatched per clutch. From the present study, it is confirmed that productive hens lay on average 10-18 eggs per clutch. Similarly, Badubi *et al.,* [14] reported that on average 11 to 15 eggs were laid by indigenous hens and 6 to 10 chicks were hatched.

Production and Reproductive Aspects: According to the survey, 68% of the farmers select productive hen by its body size, 12% by finger accommodation between the pelvic bones and 20% by pedigree performance.

Table 2: Management practices in village poultry production in mid-rift valley of Ethiopia

	East Shoa		West Arsi			
Variables	Districts Adami-Tullu	Boset	Shashamanne	Siraro	Shalla	Overall
Overnight shelter (%):						
Kitchen	0	7	0	0	0	1.4
Main house	0	29	89	73	100	58
Perch	100	22	3.7	6.7	0	26
Purpose made house	0	42	7.4	20	0	14
Frequency of cleaning: shelter (%):						
Once per day	100	43.8	100	80	-	81
Every two days	0	37.4	0	20	-	14
Every 3 to 6 days	0	18.8	0	0	-	5
Per week	0	0	0	0	-	0
Never clean	0	0	0	0	-	0
Season of incubation (%):						
Wet season	0	0	7.4	13.3	0	4
Dry season	12.5	62.5	51.9	33.3	50	42
Any time	87.5	37.5	40.7	53.3	50	54
Do you identify spoiled eggs (%)	60	66	56	74	48	61
Method of identifying spoiled eggs (%):						
Putting in water	36	46	21	17.4	22.2	28
Sun candling	36	30	39.5	43.6	44.4	39
Shaking	28	24	39.5	39	33.3	33
Average eggs hatched per clutch	4	4	6	6	5	5
Feeding system practiced (%):						
Partial supplementation	100	100	88.9	100	100	98
Scavenging	0	0	11.1	0	0	2
Zero scavenging	0	0	0	0	0	0
Season of feed shortage (%):						
Sep-Nov.	0	0	0	0	0	0
Dec-Feb.	0	0	0	0	0	0
March-may	0	15	4	6.7	0	5
June-Aug.	100	85	96	93.3	100	95

Table 3: Production and reproductive aspect of indigenous chickens

	East Shoa		West Arsi			
Variables	Districts Adami-Tullu	Boset	Shashamanne	Siraro	Shalla	Over all
Method of selecting productive chicken (%):						
Finger accommodation	0	17.5	0	12	33.3	12
Large body size	75	62.5	74	60	66.7	68
Pedigree performance	25	20	26	28	0	20
Number of eggs per clutch (no.)	10	18	14	15	14	14
Age at first laying (local chickens) %:						
Four months	60	16.6	5	0	25	21
Five months	0	27.7	26.3	64	25	29
Six months	20	27.7	42	18	50	31
Seven months	20	27	26.7	18	0	19
Method of stimulating broody hen (%):						
Hanging up down	0	43.8	47	15.4	0	21
Changing house	43	28.2	21	23	33.3	30
Providing additional feed	0	9.4	16	38.6	0	13
No interference	57	18.6	16	23	66.6	36
Broody length (if intervened) (%):						
One week	100	77.2	87	63.6	100	85
Two weeks	0	0	13	27.3	0	8
Three weeks	0	18.3	0	0	0	4
one month	0	4.5	0	9	0	3
Broody length (if not intervened) (%):						
One week	0	4.2	15	27.4	0	9
Two weeks	0	0	0	0	0	0
Three weeks	60	70.8	80	54.5	75	68
One month	30	25	5	18	25	21
Above one month	10	0	0	0	0	2

Table 4: Village poultry health Husbandry management in Mid-rift valley of Ethiopia

	East Shoa		West Arsi			
Variables	Adami-Tullu	Boset	Districts Shashamanne	Siraro	Shalla	Over all
Main causes of chicken mortality (%):						
Birds of prey	33.4	36.4	39	32	29.4	34
Cats and dogs	0	13.5	18.6	21.5	29.4	16.3
Wild animals	20	17.5	8.5	10.7	11.8	15
Diseases	46.6	32.6	30.5	35.7	29.4	34
Accident	0	0	3.4	0	0	0.7
Season frequently disease occurred (%):						
Sep-Nov.	14.3	3	8	0	0	5
Dec-Feb.	0	3	0	0	0	0.6
March-may	0	29	20	23	0	14.4
June-Aug.	85.7	65	72	77	100	80
Proportion of sick chickens died (%):						
All	37.5	64.3	81.8	86.7	66.7	67
Half	37.5	32	18.2	6.7	16.7	22
One third	25	3.7	0	0	0	6
Quarter	0	0	0	6.7	16.7	5
Average number of chicken died due to disease in the previous six months/HH	14	8	7	7	2	8
Measure taken when chicken get sick (%):						
Eat them	0	0	0	0	0	0
Sell them	0	3.1	3.7	13.3	0	4
Treat with traditional medicine	48	53.3	33.3	33.3	50	44
Consultation of veterinarian	7	12.5	18.5	6.7	12.5	11.6
Do nothing	45	28.1	44.5	46.7	37.5	40.4

Age at first egg ranges from four to seven months; according to this survey 50% of the respondent replied the age at first egg is six or seven months indicating late maturity. This also in agreement with the work done by Hallima [13] in North West Ethiopia according to Halima 31.92 % of the pullets and 20.07 % of the cocks reached maturity at 28 to 32 weeks. It was also reported that sexual maturity of female chickens to be 28 weeks in Tanzania [15], 24 weeks in Mali and Nigeria [16, 17], 32 weeks in Sudan [18], 28 to 36 weeks in Benin [19] and 25 weeks in Senegal [20]. The survey also further indicates that the number of eggs laid per clutch ranges between 10 and 18. Farmers in the survey area usually intervened broody hens to lay egg and the reduced broody length considerable. They stimulate broody hens to lay eggs by changing house 30%, Hanging upside down 21% and providing additional feed 13%.

Village Chicken Health Husbandry Management: The major causes of death of chickens over the study area were seasonal occurrence of chicken diseases, commonly Newcastle disease (locally known as “Sombe/Fengil”), followed by predation. The highest chicken death rate was observed during the rainy season (June, July and August) this finding is also similar with the work done by Halima [13] in Northwestern Ethiopia. It was indicated that in Africa one of the major constraints to village fowl production is the prevalence of various diseases [21]. According to the respondents (67%) from the sick chickens all died and 22% of the respondents replied half died from the sick. Average number of chicken died due to disease in the last six months/household in the study area ranges between 2 and 14. Farmers in the study area usually treat sick chickens using traditional medicine 44%; otherwise do nothing 41%. Only 11% of the respondents consult veterinarians when their chickens get sick; this is as a result of veterinary service insufficiency. They uses Garlic, different green leaves like ‘Bala Ganate’ Afan Oromo name, lemon, local alcohol, paper powder, butter etc as drenching, nasal application and smoking. The response to treatment vary considerably 45% recovered, 33% partial recovery and 22 no response to traditional treatment. From the survey it is understood that only 31% of the village chicken producer knows the presence of vaccine for chicken diseases and almost no farmer vaccinate their chicken. It is further indicated that 96% of the farmers in the study area want to vaccinate their chicken for a charge ranging from ten cents to five Ethiopian birr per chicken.

CONCLUSION

Village-based rural chicken production requires less space and investment and can therefore play an important role in improving the livelihood of the poor village family. Therefore focus should be given on village-based rural poultry production system and utilization system to effectively utilize the resource.

REFERENCES

1. Central Statistical Authority, 1998. Federal Democratic Republic of Ethiopia Central Statistical Agency, Report on Livestock and Livestock Characteristics Agricultural sample survey 1997/98, Addis Ababa, Ethiopia.
2. Tadelle, D. and B. Ogle, 2001. Village Poultry Production System in the Central High Lands of Ethiopia. Tropical Animal Health and Production, 33: 521-537.
3. Dhuguma Reta, 2009. Understanding the Role of Indigenous Chickens during the Long Walk to Food Security in Ethiopia. Livestock Research for Rural Development, 21(8).
4. AACMC (Australian Agricultural Consulting and Management Company), 1984. Livestock Sub-sector Review Report. Ethiopian Ministry of Agriculture, Addis Ababa, Ethiopia.
5. Fisseha, M., 2009. Studies on Production and Marketing System of Local Chicken Ecotypes in Bure Woreda, North-west Amhara Reginal State, Ethiopia. MSc Thesis, Hawasa University, Hawasa, Ethiopia.
6. Aklilu, H., C.J.M. Almekinders, H.M.J. Udo and A.J. Van der Zijpp, 2007. Village Poultry Consumption and Marketing in Relation to Gender, Religious Festivals and Market access. Tropical Animal Health and Production, pp: 39: 165-177.
7. Ashenafi, H., S. Tadesse, G. Medhin and M. Tibbo, 2004. Study on Coccidiosis of scavenging indigenous chickens in central Ethiopia. Tropical Animal Health and Production, pp: 36(7): 693-701.
8. ATARC, 1998. Oromia Agricultural Development Bureau, Adami-Tullu Research Center Profile, Ziway, Ethiopia.
9. SPSS (Statistical Procedures for Social Sciences), 2001. SPSS User's guide version 11.0. SPSS Institute Inc., Cary NC.
10. Mcainsh, C.V., J. Kusina, J. Madsen and O. Nyoni, 2004. Traditional Chicken Production in Zimbabwe. World's Poultry Science, 60: 233-246.
11. Gueye, E.F., 1997. Diseases in Village Chickens: Control through Ethno-veterinary Medicine. ILEIA Newsletter, 13(2): 20-21.
12. Tadelle, D., T. Million, Y. Alemu and K.J. Peters, 2003. Village Chicken Production Systems in Ethiopia. Livestock Research for Rural Development, 15(1).
13. Halima, H., 2007. Phenotypic and Genetic Characterization of Indigenous Chicken Populations in Northwest Ethiopia. PhD dissertation, Department of Animal, Wildlife and Grassland Sciences, University of the Free State, Bloemfontein, South Africa.
14. Badubi, S.S., M. Rakereng and M. Marumo, 2006. Morphological Characteristics and Feed Resources Available for Indigenous Chickens in Botswana. Livestock Research for Rural Development, 18(1).
15. Katule, A.M., 1992. Study on the Potential Value of Indigenous Chickens to Tanzania. African Network for Rural Poultry Development Newsletter, 2: 4.
16. Kassambara, A.I., 1989. La Production avicole au Mali: Problems et Perspectives. In Proceedings of International Workshop on Rural Poultry in Africa, 13-16 November 1989, IIe-Ife, Nigeria, pp: 140-150.
17. Sonaiya, E.B. and V.E. Olori, 1989. Village Chicken Production in South Western Nigeria. In Proceedings of an International workshop on Rural Poultry Development in Africa, 13-16 November 1989, IIe-Ife, Nigeria, pp: 243-247.
18. Wilson, R.T., 1979. Studies on the Livestock of Southern Darfur, Sudan.VII. Production of Poultry under Simulated Traditional Conditions. Tropical Animal Health and Production, 11: 143-150.
19. Assan, B.E., 1990. Lelevage Villageois de la Volaille en Republique du Benin: Situation Actuelle. CTA Seminar, proc. on smallholder rural poultry production, Thessaloniki, Greece, 2: 17-26.
20. Sall, B., 1990. Contribution a L'etude des Possibilites D'amelioration de la Production en aviculture Traditionnelle: mesure du potentiel de la race locale et des produits d'un croisement ameliorateur. M.Sc. Thesis. Institute National de Developpement Rural, Senegal.
21. Gueye, E.F., 1998. Village Egg and Fowl Meat Production in Africa. World's Poultry Science, 54: 73-86.